

NOTE**** when sequence listing is changed, the SEQ ID NO: in the claims needs to correspondingly change!

NOTE***** specification needs to be amended to include SEQ ID NO: after the sequences.

Claim 4. A quantitative method for molecular diagnosis of spinal muscular atrophy (SMA) comprising:

- obtaining a sample from a human suspected of having SMA containing mRNA of survival motor neuron (SMN-mRNA) and the mRNA of human elongation factor 1-alpha (HUMEF1AB-mRNA)
- reverse transcribing the mRNA using primers consisting of SEQ ID NO:4 for the synthesis of cDNA from SMN-mRNA giving SMN-cDNA and consisting of SEQ ID NO:5 for the synthesis of cDNA from HUMEF1AB-mRNA giving HUMEF1AB-cDNA;
- amplifying the SMN-cDNA by PCR using primers consisting of SEQ ID NO:6 and SEQ ID NO:7 and the HUMEF1AB-cDNA by PCR using primers consisting of SEQ ID NO:8 and SEQ ID NO:9
- immobilizing of the PCR products on a nylon membrane
- hybridizing the immobilized PCR products with radioactive ³²p-dCTP labeled nucleotide probes wherein the probes are generated by PCR amplification of nucleic acids consisting of SEQ ID NO:10 and 11 for exon 7; nucleic acids consisting of SEQ ID NO:12 and SEQ ID NO:7 for exon 8 and, nucleic acids consisting of SEQ ID NO:8 and SEQ ID NO:9 for HUMEF1AB,

- measuring SMN-mRNA by means of ~~BioImager~~ device using the radioactive ^{32}p -dCTP labeled nucleotide probes by detecting the hybridized probes using autoradiography and quantifying the amount of SMN-mRNA by means of a BioImager device
- wherein the quantification of between 9 and 27 PSL/mm² for exon 7 and 6-15 PSL/mm² for exon 8 is indicative of SMA disease.

Claim 5. A quantitative method for molecular diagnosis of spinal muscular atrophy (SMA) comprising:

- obtaining a sample from a human suspected of having SMA containing mRNA of survival motor neuron (SMN-mRNA) and the mRNA of human elongation factor 1-alpha (HUMEF1AB-mRNA)
- reverse transcribing the mRNA using primers consisting of SEQ ID NO:4 for the synthesis of cDNA from SMN-mRNA giving SMN-cDNA and consisting of SEQ ID NO:5 for the synthesis of cDNA from HUMEF1AB-mRNA giving HUMEF1AB-cDNA;
- amplifying the SMN-cDNA by PCR using primers consisting of SEQ ID NO:6 and SEQ ID NO:7 and the HUMEF1AB-cDNA by PCR using primers consisting of SEQ ID NO:8 and SEQ ID NO:9
- immobilizing the PCR product on streptavidin coated polystyrene
- hybridizing the immobilized PCR products with the biotin-11-dCTP labeled nucleotide probes wherein the probes are generated by PCR amplification of nucleic acids consisting of SEQ ID NO:10 and 11 for exon 7; nucleic acids

consisting of SEQ ID NO:12 and SEQ ID NO:7 for exon 8 and, nucleic acids

consisting of SEQ ID NO:8 and SEQ ID NO:9 for HUMEF1AB,

- adding the peroxidase-conjugated anti-digoxigenin antibodies
- adding the peroxidase substrates consisting of H₂O₂ and chromogene (tetramethyl benzidine)

- adding H₂SO₄ to stop the reaction

- measuring SMN-mRNA by means of microplate reader in an ELISA

procedure using the biotin-11-dCTP labeled nucleotide probes immobilized on

streptavidin polystyrene microtitration plates by detecting the hybridized

probes using ELISA and quantifying the amount of SMN-mRNA by

determining the optical density (OD)

- wherein an OD of between 0.11 and 0.19 for exon 7 and an OD of between 0.12 and 0.16 for exon 8 is indicative of SMA disease.